

Knowledge, Attitude, and Practice of Dengue Hemorrhagic Fever Prevention Among Mothers in Endemic and Non-Endemic Locations of Pekanbaru City, Riau Province, Indonesia

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Abstract

Dengue hemorrhagic fever (DHF) is an infectious disease caused by dengue virus, which is one of the serious public health problems in Indonesia, particularly Pekanbaru City, Riau Province, Indonesia. One of the DHF endemic locations in Pekanbaru City is Payung Sekaki Health Centre, where 52 DHF cases and no deaths were reported in 2018. The number of DHF cases has increased to 53 and caused 1 death in January-August 2019 period (CFR=1.89%). Karya Wanita Rumbai Health Centre is one of the DHF non-endemic areas in Pekanbaru City, where only 10 DHF cases and no deaths were reported in January-August 2019 period. The purpose of this study was to compare the knowledge, attitude, and practice of DHF prevention between mothers in endemic and non-endemic areas of Pekanbaru City, Riau Province, Indonesia. The design of this study was observational, with a cross-sectional approach. The sampling technique used in this study was accidental sampling, which included 100 respondents from each region. The data source of this study consisted of primary and secondary data. Data analysis was performed using bivariate analysis with Mann Whitney statistical test because the data were not normally distributed. The results of the study showed that there were no differences in knowledge (p -value = 0.912) and attitude (p -value = 0.065) of DHF prevention between mothers living in the endemic and non-endemic areas of Pekanbaru City, Riau Province, Indonesia. However, there were differences in practice of DHF prevention between mothers (p -value = 0.002) living in the endemic and non-endemic areas of Pekanbaru City, Riau Province, Indonesia. The conclusion of this study is that there is no difference in knowledge and attitude of DHF prevention between mothers living in the endemic and non-endemic areas, but there are differences in DHF prevention practice between mothers living in the endemic and non-endemic areas of Pekanbaru City, Riau Province, Indonesia.

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Introduction

Dengue hemorrhagic fever (DHF) is an infectious disease caused by dengue virus in which the virus is transmitted by *Aedes Spp.* *Aedes Spp.* is the fastest growing mosquito and has caused around 390 people in the world to suffer from DHF every year. DHF has symptoms similar to dengue fever, but DHF has other symptoms in the form of pain or constant pain in the solar plexus, bleeding in the nose, mouth, gums, or bruises on the skin (Indonesian Ministry of Health, 2018).

DHF is one of the serious public health problems in Indonesia, where the number of patients is increasing and the distribution is getting wider. The number of DHF cases has spread in 33 provinces and 436 districts or cities (88%) from the total of 497 districts or cities in Indonesia. DHF is an infectious disease that generally attack children of the age group of less than 15 years, but can also attack adults. According to the World Health Organisation (WHO) data in 2010, Indonesia was reported as the second country with the largest DHF cases among 30 countries with dengue endemic regions (Indonesian Ministry of Health, 2014, 2018).

The number of DHF cases in Riau Province was 1928 and caused 15 deaths in 2017 (Case Fatality Rate/CFR = 0.78%). Furthermore, DHF cases in Riau Province decreased to 918 cases and caused 8 deaths in 2018 (CFR = 0.87%) (Indonesian Ministry of Health, 2018, 2019). In 2018, Riau Provincial Health Office reported as many as 358 cases and 2 deaths in DHF (CFR = 0.56%) in Pekanbaru City in. The number of DHF cases reported in the first semester of 2019 was as many as 274 of which the most were in the working area of Payung Sekaki Health Centre, with 52 cases (Pekanbaru City Health Department, 2019a, 2019b). The number of DHF cases in the working area of Payung Sekaki Health Centre increased to 53 and 1 death (CFR = 1.89%) in January-August 2019 period. The number of DHF cases reported in Karya Wanita Rumbai Health Centre in January-August 2019 period were 10 and no death (Payung Sekaki Health Centre, 2019; Pekanbaru City Health Department, 2019b).

The amount of a particular disease that is usually present in a community is referred to as the endemic level of the disease. This level is not necessarily the desired level, which may in fact be zero, but rather is the observed level. In the absence of intervention and assuming that the level is not high enough to deplete the pool of susceptible persons, the disease may continue to occur at this level indefinitely. Therefore, the baseline level is often regarded as the expected level of the disease (CDC, 2012). The working area of Payung Sekaki Health Centre is a DHF endemic area, where the incidence of DHF often occurs and is increasing every year. However, DHF seldom occur in the working area of Karya Wanita Rumbai Health Centre, thus it is categorised as a non-endemic DHF area.



Figure 1. Basemap Pekanbaru City, Riau Province

Source : (Indonesian National Disaster Management Agency, 2014)

Based on Figure 1, it can be seen that Pekanbaru city in Riau province is located in Sumatra island. Sumatra island is located at the west side of Indonesia territory and it is bordered by Malaysia, where the two countries are separated by Malacca Strait.



Figure 2. The research location map, which is Labuh Baru Barat sub-district (endemic) and Lembah Damai sub-district (non-endemic)

Source : (Peta.Web.Id, 2020)

Based on Figure 2, it can be explained that Payung Sekaki Health Centre is located in Labuh Baru Barat sub-district of Payung Sekaki district, while Karya Wanita Rumbai Health Centre is located in Lembah Damai sub-district of Rumbai Pesisir district. Both health centre locations are in Pekanbaru City, Riau Province, Indonesia. They have a distance and travel time of approximately 7 kilometres and 30 minutes, respectively.

DHF prevention practice is related to the knowledge and attitude of the community about DHF, especially mothers, who play an important role in maintaining family health and keeping the house clean. In the context of preventing DHF, mothers will eradicate the breeding place of mosquitos if they are aware of the purpose and benefits of doing it for their family's health, and the danger or risk if it is not carried out (Notoatmodjo, 2012). The purpose of this study is to compare the knowledge, attitude, and practice of DHF prevention among mothers in endemic and non-endemic areas of Pekanbaru City.

Materials and Methods

This study used an analytic observational study design with a cross-sectional method. This study was conducted in the working areas of Payung Sekaki Health Centre and Karya Wanita Rumbai Health Centre, Pekanbaru City from July to August 2019. The research data consisted of primary and secondary data. The primary data collected was knowledge, attitude, and practice of DHF prevention of mothers. The secondary data collected was the number of female residents who were mothers living in the working area of Payung Sekaki Health Centre and Karya Wanita Rumbai Health Centre, Pekanbaru City.

The samples of this study were the mothers living in the working area of Payung Sekaki Health Centre and Karya Wanita Health Centre, Pekanbaru City, who met the study inclusion and exclusion criteria. The sampling technique used was accidental sampling, which is a sampling technique based on coincidence of which anyone can be used as a sample, if the person deems appropriate as a data source (Notoatmodjo, 2011).

The questionnaire covered domains, namely demographic information of respondents (i.e. age, address, education, and occupation) and knowledge, attitude, and practice of DHF prevention. The questionnaire comprised of close-ended questions in which the respondents could select a 'Yes' or 'No' answer and open-ended questions. Each questionnaire domain consisted of 10 questions, bringing a total of 30 questions. The questionnaire was first tested for validity and reliability before being used in the research.

The validity test of the DHF prevention behaviour questionnaire was conducted on 30 mothers who were living in the working area of Payung Sekaki Health Centre. Scale validity test was calculated by correlating each question score with the total score (the total correlation of correlated item). A question is considered valid if $r_{\text{arithmetic}} \geq r_{\text{table}}$ (Widi, 2011). A significance level of 0.05 can be seen in table r with the equation $N-2 = 30-2 = 28 = 0.361$. Out of the 10 questions on mother's knowledge of DHF prevention, 1 question was invalid, and thus was excluded from the questionnaire, while out of the 10 questions on mother's attitude of DHF prevention, 5 questions were invalid, and thus were excluded from the questionnaire. In addition, out of the 10 questions on mother's DHF prevention practice, 5 question items were invalid, and thus were excluded from the questionnaire. Furthermore, the reliability test results on the fixed DHF prevention knowledge, attitude, and practice questionnaire showed Cronbach's alpha value > 0.60 , and thus were considered reliable (Widi, 2011).

The respondents were given an explanation on the procedures for filling out the questionnaire by one of the researchers of the study. During the session, respondents were accompanied by researchers. After completing the questionnaire, respondents were given a leaflet that contained a summary of DHF prevention. The study was conducted for 7 days, which consisted of research preparations in the form of focus group discussion (FGD) between the research team and enumerators for 1 day, and retrieval of research data for 6 days. The main researcher was assisted by 12 enumerators in collecting research data from the respondents, where the enumerators had been given training and simulations about the research in advance.

The data analysis consisted of univariate and bivariate analyses. Before statistical test is performed, a normality test is performed to determine whether the data is normal or vice versa. The test used was Kolmogorov Smirnov because the sample was large (more than 50). The hypothesis was tested using Mann Whitney test because the data were not normally distributed, of which the test results were in the form of p -values (Notoatmodjo, 2015).

Although the research data of this study was in ratio scale, the knowledge, attitude, and practice variables were classified as follows for univariate analysis (Arikunto, 2006):

- a. Good, if the respondents were able to answer 76% to 100% of all the questions correctly
- b. Moderate, if the respondents were able to answer 56% to 75% of all the questions correctly
- c. Poor, if the respondents were able to answer <56% of all the questions correctly

Results

Data Normality Test

Before using the hypothesis test, it is necessary to do a data normality test to find out whether the data of a study are normally distributed or not. A data can be considered normally distributed if the p -value > 0.05 . Conversely, if the p -value < 0.05 , then the data are not normally distributed. The Kolmogorov Smirnov normality test was used in testing data normality because the study sample was > 50 . The normality test results of the research variables tested showed that the knowledge, attitude, and practice of DHF prevention questionnaire was not normally distributed (p -value < 0.05), thus the Mann Whitney test was used.

Respondent Characteristics

Table 1. Frequency Distribution of Respondent Characteristics

No	Respondent Characteristics	Endemic		Non-Endemic	
		N	%	N	%
1.	Age (years)				
	20-29	13	13.0	15	15.0
	30-39	40	40.0	36	36.0
	40-49	29	29.0	30	30.0
	50-59	13	13.0	13	13.0
	60-69	3	3.0	5	5.0
	70-79	2	2.0	1	1.0
2.	Education				
	Uneducate	3	3.0	1	1.0
	Primary School	9	9.0	11	11.0
	Junior High School	11	11.0	12	12.0
	Senior High School	57	57.0	55	55.0
	Academy / University	20	20.0	21	21.0
3.	Occupation				
	Labour	0	0.0	1	1.0

	Civil servant	1	1.0	0	0.0
	Private employee	5	5.0	7	7.0
	Entrepreneur	5	5.0	8	8.0
	Other job	5	5.0	5	5.0
	Housewife	84	84.0	79	79.0
4	DHF Prevention Knowledge				
	Poor	26	26.0	26	26.0
	Moderate	48	48.0	54	54.0
	Good	26	26.0	20	20.0
5	DHF Prevention Attitude				
	Poor	2	2.0	7	7.0
	Moderate	4	4.0	5	5.0
	Good	94	94.0	88	88.0
6	DHF Prevention Practice				
	Poor	27	27.0	25	25.0
	Moderate	29	29.0	18	18.0
	Good	44	44.0	57	57.0
	TOTAL	100	100.0	100	100.0

Based on Table 1, it can be seen that the majority of respondents in the endemic and non-endemic areas were in the 30–39 age range, with 40 mothers (40%) and 36 mothers (36%), respectively. In addition, the majority of respondents in the endemic and non-endemic areas had high school education, with 57 mothers (57%) and 55 mothers (55%), respectively. In addition, the majority of respondents in the endemic and non endemic areas were housewives, with 84 mothers (84%) and 79 mothers (79%), respectively.

For the knowledge of DHF prevention, both respondents from the endemic and non-endemic areas were in the category of moderate knowledge, with 48 mothers (48%) and 54 mothers (54%), respectively. For the attitude of DHF prevention, both respondents from the endemic and non-endemic areas were in the good attitude category, with 94 mothers (94%) and 88 mothers (88%), respectively. For the DHF prevention practice variable, both respondents from the endemic and non-endemic areas were mostly in the good practice category, with 44 mothers (44%) and 57 mothers (57%), respectively.

Central Tendency and Dispersion

Table 2. Central Tendency and Dispersion

Variable	Endemicity	Mean	Median	Min	Max	N
DHF Prevention Knowledge	Endemic	57,48	59	18	86	100
	Non-Endemic	56,60	60	8	82	100
DHF Prevention Attitude	Endemic	46,90	50	10	50	100
	Non-Endemic	44,50	50	10	50	100
DHF Prevention Practice	Endemic	22,60	20	0	40	100
	Non-Endemic	28,60	30	0	50	100

Based on Table 2, it can be seen that the mean value of DHF prevention knowledge of respondents in the endemic area (57.48) was higher than the non-endemic area (56.60), the mean value of DHF prevention attitude of respondents in the endemic area (46.90) was higher than the non-endemic area (44.50), and the mean value of DHF prevention practice of respondents in the endemic area (22.60) was lower than the non-endemic area (28.60).

Mann Whitney Test

Table 3. Knowledge, Attitude, and Practice of DHF Prevention among Mother

Variable	Mann Whitney Test	
	N	100
DHF Prevention Knowledge	<i>p</i> -value	0.912
DHF Prevention Attitude	N	100
	<i>p</i> -value	0.065
DHF Prevention Practice	N	100
	<i>p</i> -value	0.002

Based on the results of the Mann Whitney test in Table 3, it can be seen that the respondents' DHF prevention knowledge and attitude have p -value > 0.05 , thus it can be considered that there was no difference in the knowledge and attitude of DHF prevention between mothers living in the endemic and non-endemic areas. However, the respondents' DHF prevention practice has a p -value < 0.05 , thus it can be considered that there were differences in DHF prevention practice between mothers living in the endemic and non-endemic areas.

Discussion

Based on the research conducted on 100 mothers in the Payung Sekaki Health Centre area and 100 mothers in the Karya Wanita Rumbai area from July to August 2019, the significance value obtained showed that there was no significance in the knowledge and attitude of DHF prevention between mothers living in the endemic and non-endemic areas, with p -values 0.912 and 0.065 (p -values > 0.05), respectively. Therefore, it can be concluded that there is no difference in the knowledge of DHF prevention between mothers living in the endemic and non-endemic areas of Pekanbaru City. However, a significant value was obtained in the DHF prevention practice of mothers living in the endemic and non-endemic areas, with p -value 0.002 (p -value < 0.05). Therefore, it can be concluded that there are differences in the DHF prevention practice between mothers living in the endemic and non-endemic areas of Pekanbaru City.

Knowledge is the result of knowing which occurs after a person senses a certain object. Sensing occurs through the five human senses, namely sight, hearing, smell, taste, and touch. Most of the human knowledge is obtained through eyes and ears. Knowledge or cognitive domain is a very important domain in shaping one's actions. Attitude is not yet an action or activity, but it is a predisposition to the action of a behaviour. Therefore, attitude is still a

closed reaction, not an open reaction or open behaviour. Attitude is a readiness to react to objects in a particular environment as an appreciation of the objects (Notoatmodjo, 2012). The formation of new behaviours (adoption of behaviour) in a person starts from knowing the meaning and benefits of the behaviour for himself or his family in advance. In the process of adopting new behaviours, a person's successive processes occur as follows (Notoatmodjo, 2012):

- 1) Awareness; that someone is aware of the sense of knowing the stimulus (object) first
- 2) Interest; is when someone starts to be attracted to the stimulus
- 3) Evaluation; is when someone considers whether or not the stimulus is good for him. This means that someone's attitude is better than before.
- 4) Trial; where the subject has begun to try to do something in accordance with what is desired by the stimulus
- 5) Adoption; where the subject has recently behaved and practiced in accordance with his knowledge, awareness, and attitude to the stimulus

Based on the results of this study, the majority of respondents in the endemic and non-endemic areas were in the 30–39 age range, with 40 mothers (40%) and 36 mothers (36%), respectively. Age group had no association with respondents' DHF prevention knowledge (Harapan et al., 2018). The majority of respondents in the endemic and non-endemic areas had high school education, with 57 mothers (57%) and 55 mothers (55%), respectively. Respondents with a higher education level were more knowledgeable and showed appropriate attitudes and good practices. Furthermore, that explains the importance of education in changing the attitude and level of practice of DHF prevention (Gong et al., 2019). In addition, the majority of respondents in the endemic and non endemic areas were housewives, with 84 mothers (84%) and 79 mothers (79%), respectively. Mothers as housewives play a major role in domestic works, which are directly connected to DHF prevention practice. They are the ones who collect and store water for domestic use, take care of ill members in their family, and clean up the breeding places of mosquitoes (Dhimal et al., 2014).

The study result on knowledge variable of DHF prevention showed that both respondents in the endemic and non-endemic areas were in the moderate category, with 48 mothers (48%) and 54 mothers (54%), respectively. The respondent's knowledge needs to improve because knowledge will influence attitude and practice regarding DHF. For the attitude variable of DHF prevention, both respondents in the endemic and non-endemic areas were mostly in the good category, with 94 mothers (94%) and 88 mothers (88%), respectively. This result shows that the majority of respondents had a less perceived risk of DHF and support towards DHF control. It might also be partially influenced by characteristic individuals who did not perceive the benefit of DHF prevention. Furthermore, it needs attention for the modification of health promotion- related DHF prevention. For the DHF prevention practice variable, both respondents in the endemic and non-endemic areas were mostly in the good category, with 44 mothers (44%) and 57 mothers (57%), respectively. One of the reasons for the good category attained in this study was because many questions on the level of practice were related to daily practices of DHF prevention. On the other hand, the

previous study reported that most people who had a good attitude towards DHF prevention by monitoring mosquito larvae found half of the people said the obstacle was no time to monitor mosquito larvae. Therefore, awareness programme is urgently needed to raise the respondents' knowledge regarding DHF (Martina, Bratajaya, & Ernawati, 2018).

In this study, the researchers found that mothers who live in the endemic area have a better knowledge and attitude of DHF prevention, but they have a lower practice of DHF prevention than mothers who live in the non-endemic area. This is similar to the previous study in Vietnam where people who reported a high density of mosquitoes were found more likely to have good knowledge and attitude. However, the result is not similar to the previous study which found that people who reported a high density of mosquitoes were found more likely to have good practice of DHF prevention. It can be explained by the fact that people who live in high-risk or endemic areas have more serious perceptions of mosquito-borne diseases, such as DHF and dengue fever (DF), though the perceptions of mosquito-borne diseases were not always in line with the practice of DHF prevention (Nguyen et al., 2019). The results of this study were also dissimilar to a study conducted in Selangor, Malaysia in which communities that lived in the non-endemic areas of dengue outbreaks had better knowledge and attitude of dengue than communities that lived in the endemic areas, but no significant difference was found in the practice category between communities in both areas (Ghani et al., 2019). Another research on residents of Wardha Districts, Maharashtra State, India indicated that there was a significant relation between knowledge and attitude towards Aedes control. A wide gap that can be seen between prevention knowledge and practice was most likely due to the respondent's financial condition (Taksande & Lakhkar, 2013).

DHF is still a major health problem around the world, especially in South-East Asia. In the absence of vaccine, the only effective strategy to control DHF outbreak is to eliminate Aedes mosquitoes and their larval habitats. Further efforts should be directed at addressing the barriers to behavioural change, correcting misconception on the spread of dengue through social and close contacts and educating the illiterate on measures to prevent dengue. Aedes larval breeding sites in the domestic and peri-domestic environment could increase due to poor hygiene and failure in checking the breeding places of aedes mosquitoes as well as reluctance to have their homes fogged with insecticides. The key to success in controlling dengue vector is active participation of the government, local organisation, and the public (Kaushik, Singh, & Srivastava, 2019).

DHF prevention practice includes eradicating mosquito breeding places related to the incidence of DHF in an area. Mosquito breeding places eradication is an example of healthy living behaviour because it is related to efforts in preventing DF by breaking the chain of dengue transmission. Mosquito breeding places eradication should be carried out simultaneously and continuously by all levels of society (Indonesian Ministry of Health, 2016). The results of the study by Jata et al. (2016) found that there was a relation between community practice in mosquito breeding places eradication and the incidence of DHF in the area of Puskesmas I in South Denpasar and Puskesmas I in Denpasar Timur Bali (Jata, Adi Putra, & Pujaastawa, 2016). According to the results of other study, there was a significant

relation between practice of mosquito breeding places eradication and incidence of DHF in Andalas Village, Padang (p -value = 0.001) (Priesley, Reza, & Rusjdi, 2018).

The results of this study must be interpreted with caution because the study design was cross-sectional, which assessed the comparison of mothers' DHF prevention knowledge attitude, and practice at one point in time. It is possible that some respondents might have provided socially desirable responses to some questions, especially in the attitude and practice domains since the survey was conducted by an interviewer based on the use of structured questionnaire and many questions on practice domain were related to daily practices of the mosquito-borne diseases control. The other limitations of this study were inadequate sampling size and sampling method. However, this study provides baseline information on relevant comparison of DHF prevention knowledge, attitude, and practice between mothers living in endemic and non-endemic areas in Pekanbaru City, Riau Province, Indonesia.

Conclusion

In conclusion, there is no difference in the knowledge and attitude of mothers on DHF prevention, while there are differences in the practice of DHF prevention between mothers living in the endemic and non-endemic areas of Pekanbaru City, Riau Province, Indonesia. Health workers should increase the level of public knowledge on effective and efficient DHF prevention, namely mosquito breeding places eradication. Moreover, mosquito breeding places eradication should be carried out simultaneously and continuously at all levels of society. The mobilisation of female community health volunteers will be very important, as they have very good networks at the household level, especially mothers' group, and represent the largest work force of the health sector in Indonesia. Adequate DHF prevention knowledge of mothers can lead to appropriate DHF prevention attitude, thus resulting in good DHF prevention practice of mothers.

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